

**COMMONWEALTH OF MASSACHUSETTS
STATE BUILDING CODE
780 CMR, 9th Edition**

**FIRE PROTECTION SYSTEMS
CHAPTER 9**

***GUIDELINES FOR THE PREPARATION
OF FIRE PROTECTION SYSTEM
NARRATIVE REPORTS***

780 CMR – 901.2.1 Tier One Construction Documents

Process by which Building Permit is obtained

780 CMR – 901.2.1 Tier Two

**Process by which Building Department & Fire Department
approves the commencement of the installation of
fire protection systems**

**page 15 of Construction Control Document and page 8 of Fire Protection
Narrative must be sign by Building Department also Fire Department
before any fire protection commencement begins**

**After Tier One is obtained, Tier Two is the process by which the Building Department
and Fire Department
approves the commencement of the installation of fire protection systems**

**To All Contractors: FIRE DEPARTMENT CONSTRUCTION AND TIER 2
REQUIRED DOCUMENTS**

For Plan Review, Approval to Install and Rough Inspections

- **Two (2) Copies of all required Tier II documents shall be submitted in separate, marked packets to the Fire Department and the Building Department, respectively, for all required and non-required Fire Protection/Detection Systems.**
- **All documents shall be submitted prior to receiving an Authorization of Commencement to Install, as depicted in the Building Packet, page 8, Construction Control Document or page 15 of the Fire Protection Narrative.**
- **Fee Schedule: Fire Alarm Systems (Residential and Commercial) \$50.00 per Unit.
One Unit=one apartment, one condo, one commercial tenant space.
Sprinkler System-\$100.00**

The fee shall accompany the Fire Department required document packet, in the form of a check, made out to the Town of Grafton. This check shall be separate from, and in addition to, any Building Department fees.

- **All required documents are to be submitted as a package. Partial submittals will not be accepted.**
- **Required documents are also needed for modifications, alterations, additions or deletions of an existing system.**

If a Fire Department pre-construction conference is needed, contact the Fire Department business office.

FIRE PROTECTION SYSTEMS NARRATIVE REPORTS

The interaction of fire protection systems can be extremely complex. The detection of a fire in a building by an automatic device may be designed to initiate other life saving fire protection systems or devices, or other mechanical systems

In some circumstances life different individuals or different companies may design safety systems, which are required to interact. The narrative report is intended to provide a single document, which describes the design rationale of all fire protection systems and the interface between systems. It is an invaluable tool for building officials, fire officials, building owners and maintenance personnel.

780 CMR 901.2.1 Tier One Construction Documents requires the submission of so called fire protection systems narrative reports as part of the construction documents, which must be filed in order to obtain a building permit or must be submitted along with the requirements for a Tier Two Review for approval prior to installation of any Fire Protection Equipment.

The following document has been developed to assist end users of the Massachusetts State Building Code in the preparation “*narrative reports*” for fire protection systems as required in 780 CMR 9 (Section 901.2.1)

NARRATIVE REPORTS
As regulated by 9th Edition, 780 CMR, Section 901.2.1

GENERAL

901.2.1.1 Fire Protection Construction Documents:

1. a. Basis (methodology) of design for the protection of the occupancy and hazard for compliance with 780 CMR and applicable NFPA Standards, in the form of a narrative report.
- b. Sequence of operation of all fire protection systems and operation in the form of a narrative report.
- c. Testing criteria to be used for final system acceptance in the form of a Narrative report.

DEFINITION

A Narrative Report is a written summary description of the building or structures and all applicable fire protection systems and related operational features. Explains the analogy and methodology used by the designers in the design of the systems for the protection of the building occupants and emergency response personnel for all required and non-required fire protection systems.

APPLICABILITY

Required fire protection system installed in new buildings or structures, required fire protection system modification or addition to an existing system, non-required fire protection systems regulated by regulatory codes other than 780 CMR or voluntarily installed require approval, permits and inspections by building and fire department officials.

The enforcement provision of 780 CMR requires that a narrative report be submitted as part of the plan review and prior to the issuance of building permit. Administratively depending on the project size, scope and complexity, the code official should make a reasonable decision as to require a full comprehensive or partial report.

A Narrative Report for detached one and two family dwellings is not a requirement of Section 901.2.1 Tier One Construction Documents, however a limited version of the narrative Report identifying the type and style of household fire warning systems to be installed is recommended.

PURPOSE

Expedites the plan review and inspection process by building and fire officials. It is maintained on file for use at time of final inspection and periodic reviews during future field inspections. Is referenced to insure that all future modifications, alterations, addition

or deletion to the original systems are current and that the original system's protection and required system performance are not compromised or have been altered without building or fire official prior review.

Building owners benefit by knowing how their building's fire protection and life safety systems work and provides procedures and method for testing and maintenance. A copy of the Narrative Report should be kept on the premises and be available for review prior to testing or proposed modifications to be made to any portion of the building's life safety systems

DEVELOPMENT & SUBMISSION FORMAT

Prepared by a qualified, identified individual who has "taken charge" in the development of an entire coordinated "report" which includes all information regarding the design basis, sequence of operation and testing criteria associated with all required or non-required fire protection systems set forth by applicable Laws, Regulations and Standards.

The "report" is to be submitted with plans and specifications for review and approval by code officials prior to the issuance of a building permit. The Narrative Report should be written in a clear conversational format. The installation specification is not considered a Narrative Report. The Narrative Report is a stand alone document, 8½" x 11" for filing and ease of use by code officials, including an administrative cover page identifying the project name, building address, name, address and phone number of the individual who has "taken charge" in the preparation of the Narrative Report.

COMMENTARY

The promulgation of the State Building Code is written in a way to require uniformity for all buildings and structures regardless of local conditions. The intent of the codes can be subjective and interpretative by both designers and code officials; uniformity is not always necessarily achieved.

The Narrative Report attempts to clarify to the code official the designer's intent and his interpretation of the code. The code official may agree or disagree with the designer's interpretation.

Historically the requirements for fire protection systems have become site specific and building code requirements not uniformly enforced. The size of the community, fire department staffing, fire department equipment availability and suppression tactics established by the local fire department have effected the uniformity of enforcement. Site specific requirements less than or more than the building code requires may have reasonable intent; however, this type of enforcement in some cases has proven to be controversial in the applicability of code uniformity.

The Narrative Report can be a valuable instrument when accurately prepared; it will establish a line of communication between the designer and the code official resulting in what the building code mandates, uniformity and consensus in the interpretation of the codes.

901.2.1 Tier One Construction Documents

(a.i.) BASIS (METHODOLOGY) OF DESIGN

This portion of the narrative report should be broken down into the following six sections

SECTION 1 901.2.1 Tier One Construction Documents - Building Description

This section identifies specific features of a building that contributes to the overall understanding of the fire protection systems and features required to be identified in the Narrative Report

- a) Building “Use” Group
- b) Total square footage of building
- c) Building height
- d) Number of floors above grade
- e) Number of floors below grade
- f) Square footage per floor
- g) Type(s) of occupancies (hazards) within the building
- h) Type(s) of construction
- I) Hazardous material usage and storage
- j) High storage of commodities within a building usually over 12 ft.
- k) Site access arrangement for emergency response vehicles

SECTION 2 - Applicable Laws, Regulations and Standards

This section identifies regulatory codes and standards that may have an impact in the design and plan approval of the required and the non-required fire protection systems as per the requirements of 780 CMR, requiring the preparer of the Narrative Report to have had conducted a comprehensive code research

- a) 780 CMR code sections “Fire Protection System Requirements” and Edition
- b) NFPA Standards and Edition used for design of each specific fire protection system
- c) Applicability of Sections of M.G.L., Chapter 148, “Fire Prevention”
- d) Applicability of Sections of 527 CMR “Fire Prevention Regulations”
- e) Applicability of “approved” local by-laws or ordinances (*state specific ordinance*)
- f) Applicability of specialized codes (plumbing, elevator, and electrical, architectural access)
- g) Applicability of Federal Laws (OSHA, ADA, etc.)

SECTION 3 - Design Responsibility for Fire Protection Systems

This section identifies the accountability for a specific fire protection system design and the accountability for the integration of the fire protection systems constituting a building life safety system.

- a) The professional engineer (PE) fully designs (complete layout and calculations) and specifies the fire protection system or systems to be installed, reviews and approves the installing contractor's shop drawings. The PE is considered the engineer of record and certifies system installation for code compliance at completion.
- b) The professional engineer (PE) provides a partial design and specifies the design criteria to be used by the installing contractor who finalizes the system layout, provides calculations to confirm the design criteria. The PE reviews and approves the installing contractor's final layout and calculations. The PE is considered the engineer of record and certifies system installation for code compliance at completion.
- c) Design-build, the installing contractor completely designs and specifies (develops a full system layout, design criteria and calculations), installs the system and certifies system installation for code compliance at completion. There may be a professional engineer involved but not necessarily.

Whichever above method is selected, the project requires an engineer of record to assume responsibility for the coordination of each specific fire protection system requiring integration, forming an entire building life safety system.

SECTION 4 - Fire Protection Systems to be Installed

This section identifies key "performance design criteria" and features for each specific fire protection system

- a) Water supply, fire mains and hydrants
- b) Automatic sprinkler systems and components
- c) Standpipe systems and components
- d) Fire alarm systems and components
- e) Automatic fire extinguishing systems
- f) Manual suppression systems
- g) Smoke control/management systems
- h) Kitchen cooking equipment and exhaust systems
- i) Emergency power equipment
- j) Hazardous material monitoring equipment
- k) Seismic considerations

The description (specific features) for the above fire protection systems shall also indicate if the system is:

- Required by Regulations, Law or “approved” by-law or Ordinance
- Non-required, developer provides voluntarily
- A complete new system
- An addition or expansion to existing system
- A modification/repair to existing system
- Level of protection to be provided, 100% or partial protection or exempt by regulatory code

SECTION 5 - Features Used in the Design Methodology

This section identifies the designer’s intent in the overall design and criteria development of either a required or a non-required system.

- a) Building occupant notification and evacuation procedures
- b) Emergency response personnel, site and systems features
- c) Safeguards, fire prevention and emergency procedures during new construction and impairment plans associated with existing system modifications.
- d) Method for future testing and maintenance of systems and documentation

SECTION 6 - Special Consideration and Description

This section identifies the designer’s intent to deviate from prescriptive requirements of regulatory codes and standards with alternative methods.

- a) Application of “performance-base design” in lieu of prescriptive code requirement
- b) Interpretation/clarification between designer and code officials
- c) Waiver or variance sought through the regulatory appeal process

901.2.1 Tier One Construction Documents

(1. a. ii.) SEQUENCE OF OPERATION

This portion of the narrative report is a difficult section to write as it entails the specific operation of system devices and equipment and their related integration.

SECTION 1

- a) An operational description of either a system or specific devices within a system and the “resulting action” associated with the operation of the system or specific devices
- b) The operational description shall include all interconnected (integrated) fire protection systems and devices required or non-required forming an entire building life safety system

- c) All signage indicating equipment location, operational and design features and certified documents attesting to system installation integrity

This section of the narrative report can be brief as in a simple system such as a one story 15,000 sq.ft. mercantile building with only a sprinkler system and fire alarm notification devices. Or complex, such as in a 25 story high-rise hotel with fire pumps, emergency generator, fire alarm and sprinkler zones, automatic standpipes, automatic voice and manual evacuation signals, smoke management system, automatic elevator recall, special extinguishing systems, remote annunciation, automatic locking devices, alarm retransmission methods and emergency response procedures.

The sequence of operation of a building life safety system, particularly with complicated systems must be reviewed and understood by code officials. A team approach should be used by developers, designers, equipment suppliers, contractors including code officials to clearly describe and understand the proper operation of the integrated systems.

When a complex system is proposed, the initial narrative report of the “sequence of operation” should be viewed only as a draft. At various stages of installation modifications may be made. The designers should submit a final narrative for approval by the code officials prior to witnessing a system acceptance.

Communication between the developers and code officials is an important element particularly in this phase, as the building codes and the NFPA Standards tend to be flexible and interpretative.

901.2.1 Tier One Construction Documents

(1. a. iii.) TESTING CRITERIA

This portion of the narrative report should be broken down into the following three sections

SECTION 1 - Testing Criteria

This section identifies the individual in charge who will coordinate the final acceptance testing and witnessed by appropriate code officials

Personnel

- a) Identification of professional in charge for setting up and coordinating all testing
- b) Method of verification and confirmation by professional in charge that all fire protection systems, equipment and devices have been individually tested and tested as an entire system when specific systems are integrated to form a building life safety system
- c) Method of coordination by professional in charge of all contractors, equipment distributors and code officials required to perform and witness all testing, testing

dates and times, notification to public utilities, personnel required to perform all required testing as a system or individual system component testing

SECTION 2 - Equipment and Tools

This section will identify the necessary equipment available on site at time of witnessing the operational features of the fire protection systems, integrated building life safety and systems that require validation from code officials to expedite the acceptance testing.

- a) Identification of equipment and procedures to be used to verify system performance

Example:

Manufacturer's instructions

Specifier's special instructions

Approved Narrative Report, sequence of operation section

Smoke machines

Smoke candles

Sound meters

Fire hoses, nozzles

Flow measuring devices

Gauges

Voltage meters

Magnets

Communication radios

Fire department equipment

Special tools

Notification announcements

SECTION 3 - Approval Requirements

This section identifies all the "close-out" documents for the code officials' departmental records

- a) Establish method of approval required (verbal or written) from code official if system satisfies all operational code compliance requirements
- b) Establish method of remedial action when a system or portion of a system fails to operate satisfactorily
- c) Documentation to be submitted to code officials at completion verifying that systems are in compliance with all laws, regulations and standards and pre-approved narrative reports
- d) Documentation as required by 780 CMR, Section 901.2.1
- e) Documentation to be submitted to code officials listing names, addresses and telephone number of personnel for emergency notification

DEFINITIONS

Fire Protection Systems - Automatic sprinkler systems, fire detection system, fire alarm notification system, smoke control system, kitchen hood suppression system, etc.

Building Life Safety System - A combination of fire protection systems and other building fire protection features such as automatic door closers, emergency generators, emergency egress lighting, elevator systems, etc., interconnected or integrated with multiple fire protection systems functioning simultaneously when activated.

Preparer of Narrative Report - An individual who has taken charge of a project and has knowledge of required and non-required fire protection systems and buildings life safety systems. *The designer in charge of a specific design for a fire protection system may prepare their portion of the Narrative Report to be submitted to the individual who has "taken charge". The individual who has "taken charge" shall compile the data from the designer of each system and prepare a single, comprehensive and coordinated final Narrative Report describing each system and when applicable a description of how each system interfaces with the building life safety system's integration and sequence of operation. The take charge individual may be the architect, engineer of record, and the designer of any of the fire protection systems or an independent qualified consultant.*

REQUIREMENTS TO OBTAIN INSTALLATION OF FIRE PROTECTION EQUIPMENT PERMITS FROM THE BUILDING DEPARTMENT

2. Tier Two, Shop Drawings - Prior to installation of fire protection systems, shop drawings, where applicable, shall be submitted to the *building official* and fire official and shall contain, but not be limited to; detailed design layout, equipment specifications, system sequence of operation, and analysis to substantiate the design. Shop drawings shall note the name(s), license number(s) and license expiration date(s) of the contractor(s) installing the fire protection systems.

Exception. For shop drawings of Fire Alarm and Detection Systems see section 907.1.2 for applicable requirements.

3. Tier Three, Record Drawings - As built plans shall be provided to the building owner for all fire protection and life safety systems that are sealed as reviewed and approved by the *registered design professional* or legally recognized professional performing Construction Control. Where changes to original shop drawings are minor, a list of as-built changes shall be permitted to be submitted where sealed and reviewed and approved by the *registered design professional* or legally recognized professional performing Construction Control.

Enclosed in this packet for your convenience is the required fire protection construction document check list.

REQUIRED FIRE PROTECTION CONSTRUCTION DOCUMENTS

-
- All documents shall be submitted prior to the installation of all required and non-required fire protection/detection systems. A building permit **shall be obtained prior to installation**.
 - This includes: modification, alterations, additions or deletions to an existing system.

This check sheet is to accompany the submittal of all required documents for plan approval and review.

****All required documents are to be submitted as a package. Partial submittals will not be accepted.**

All installations shall be done according to the provisions of M.G.L. Chapter 148, CMR's 780 and 527 and NFPA.

	REQUIRED DOCUMENTS	Included	Missing	N/A
1.	PLANS- 1 set of wet stamped plans shall be submitted with catalog sheets of all devices; In addition to the number of sets the contractor would want returned after markup/review.			
2.a.	Narrative Report- Basis of design for the protection of the occupancy and hazards.			
b.	Narrative is to include: scope of work to be performed, use group, building construction type and hazard use group.			
c.	Narrative is to include sequence of operation of all fire protection systems.			
d.	Narrative is to include testing criteria to be used for final system acceptance.			
3.	A copy of the State License of every person who will be working on systems.			
4.	Plans shall include Building & Site Access for firefighting and rescue vehicles and personnel.			
5.	Plans shall include Hydrant location and water supply information.			

	REQUIRED DOCUMENTS	Included	Missing	N/A
6.	Plans shall include Automatic Sprinkler System -type/description and design layout of all equipment.			
7.	Plans shall include Automatic Sprinkler System -control equipment location.			
8.	Plans shall include Kitchen Extinguishing System(s) -type/description and design layout of equipment.			
9.	Plans shall include Kitchen Extinguishing System(s) -control equipment location.			
10.	Plan shall include Automatic Standpipe System -type/description and design layout of equipment.			
11.	Plan shall include Standpipe System -type and location of hose valve(s).			
12.	Fire Department Siamese Connection -type and location. When was flow test taken? Where was flow test taken from?			
13.	Fire Protective Signaling System -Type/Description and design layout of Fire Protective Signaling System(s).			
14.	Fire Protective Signaling System -Control Equipment and remote annunciator location.			
15.	Fire Protection System(s) -equipment room location.			
16.	Fire Protection System(s) -equipment identification and operational signs.			
17.	Fire Protection System(s) -alarm/ supervisory signal transmission method and location.			
18.	Auxiliary Equipment -Life Safety Systems required to be integrated as part of the fire protective signaling system.			
19.	Smoke Control or Exhaust System -type/description and design layout of equipment.			
20.	Smoke Control or Exhaust System -control equipment location.			

780CMR – 901.2.1 Tier Two Process

Approves the commencement of the installation of
Fire protection systems

Page 15 of Construction Control Document and page 8 of Fire Protection
Narrative must be sign by Building Department also Fire Department
Before any fire protection commencement begins

Tier Two is the process by which the Building Department and
Fire Department approves the commencement of the installation of fire
protection systems

To All Contractors:

FIRE DEPARTMENT CONSTRUCTION AND TIER 2 REQUIRED DOCUMENTS

For Plan Review, Approval to Install and Rough Inspections

- Two (2) Copies of all required Tier II documents shall be submitted in separate, marked packets to the Fire Department and the Building Department, respectively, for all required and non-required Fire Protection/Detection Systems.
- All documents shall be submitted prior to receiving an Authorization of Commencement to Install, as depicted in the Building Packet, page 8, Construction Control Document or page 15 of the Fire Protection Narrative
- **Fee Schedule: Fire Alarm Systems (Residential and Commercial) \$50.00 per Unit. One Unit=one apartment, one condo, one commercial tenant space. Sprinkler System-\$100.00**

The fee shall accompany the Fire Department required document packet, in the form of a check, made out to the Town of Grafton. This check shall be separate from, and in Department fees.

- All required documents are to be submitted as a package.
Partial submittals will not be accepted.
- Required documents are also needed for modifications, alterations, additions or deletions of an existing system.

If a Fire Department pre-construction conference is needed, contact the Fire Department business office.

APPROVAL COMMENCEMENT to INSTALL FIRE PROTECTION SYSTEMS

Required information for Tier Two Review as per Chapter 9 Section 901.2.1(2)

Date: _____

Project Name: _____

Project Location _____

Contractor Name: _____

Address: _____

City _____ State _____ Zip _____

Tel No _____ Fax No _____

Contractor License Number: _____ License Expiration Date: _____

Installing Contractor Name: _____

Installing Contractor License Number: _____ License Expiration Date: _____

FIRE PROTECTION CONTRACTOR RESPONSIBILITIES

IN ACCORDANCE WITH THE MASSACHUSETTS STATE BUILDING CODE I WILL PERFORM THE CONTRACTORS SERVICES REQUIRED AS FOLLOWS:

1. Execution of all work in accordance with the approved construction documents.
2. Execution and control of all methods of construction in a safe and satisfactory manner in accordance with all applicable local, state, and federal statutes and regulations.
3. Upon completion of the construction, I shall to the best of his knowledge and belief that such has been done in substantial accord with 780 CMR Massachusetts State Building Code 8th Edition.

Signature of Responsible Party Date

Building Department Approval Date

Fire Department Approval Date